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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,521	10/04/2005	Hannu Nikunen	30-575	7816
23117 7590 08/14/2009 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER				
PRICE, CARL D				
ART UNIT		PAPER NUMBER		
3749				
MAIL DATE		DELIVERY MODE		
08/14/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/518,521

**Applicant(s)**

NIKUNEN ET AL.

**Examiner**

Carl D. Price

**Art Unit**

3749

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04/23/2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
- Paper No(s)/Mail Date 07/23/2009
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### Response to Arguments

Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

Applicant has amended the claims to be of a scope not previously considered. Consistent with applicant's argument that the prior art relied on in the previous office action fail to show, disclose and/or teach certain aspects of applicant's invention now recited in the claims filed on 07/23/2009, applicant has amended the claims to include at least the following:

1. (currently amended)

A method of generating a flame in a combustion zone of a rotary kiln comprising:

(a) providing a rotary kiln having a kiln wall which defines a combustion zone within the rotary kiln, and a burner which comprises at least a burner tube having a front end located outside the kiln wall of the rotary kiln and extending therefrom through the kiln wall into the rotary kiln to a discharge end located inside the rotary kiln within the combustion zone thereof, and a burner lance for introducing fuel into the burner tube for combustion with primary air to generate a flame at the discharge end of the burner tube within the combustion zone of the rotary kiln;

(b) generating a flue gas by a gas turbine located outside the kiln wall;

(c) directing the flue gas generated by the gas turbine to the burner tube so that the flue gas is used as primary air for combustion of the fuel introduced into the burner tube by the burner lance; and

(d) combusting the fuel using the flue gas as primary air to generate a flame at the discharge end of the burner tube in the combustion zone of the rotary kiln.

In response to the prior art of record cited in the previous examiner's action and in support of the scope of the invention now presented in the amended claims, applicant argues the following:

Art Unit: 3749

"The prior pending claims have also been revised in an effort to clarify the claimed subject matter and to define the present invention patentably over the applied prior art. In this regard, the pending claims have been amended so as to emphasize that a *rotary kiln* is provided having a kiln wall which defines a combustion zone therewithin. The kiln is also required to have a burner which comprises at least a burner tube having a front end and a discharge end, the discharge end being located outside the kiln wall of the rotary kiln and extending therefrom through the kiln wall into the rotary kiln to the discharge end located inside the rotary kiln within the combustion zone thereof. A burner lance is provided for introducing fuel *into the burner tube* for combustion with primary air to generate a flame *at the discharge end of the burner tube* within the combustion zone of the rotary kiln. A flue gas is generated by a gas turbine located outside the kiln wall which in turn is directed to the burner tube so that the flue gas is used as primary air for combustion of the fuel introduced into the burner tube by the burner lance where it is combusted with the fuel as primary air to generate a flame at the discharge end of the burner tube in the combustion zone of the rotary kiln."

"Claims 13-18 are new and define that the burner lance is concentrically positioned within the burner tube (see page 3, lines 23-25 and Fig. 1); the burner lance feeds fuel into the burner tube at the discharge end thereof (original claim 3 and page 3, lines 21-23); and that the burner lance feeds fuel into the burner tube at the front end thereof for mixing with the flue gas as primary air directed to the burner tube from the gas turbine by the connecting tube (page 3, lines 25-28)."

In response to applicant's argument(s) directed to the prior art previously relied on, and in response to the scope of the invention now set forth in the presently amended claims, the following examiner's action now relies on the prior art reference(s) of **JP 51- 136716** (newly cited by applicant), **JP 07-208705** (newly cited) and **DE 100 62 066**. Most notably, with regard to the now claimed invention, **JP 51- 136716** shows and discloses a burner lance (2) is provided for introducing fuel into the burner tube (9) for combustion with primary air to generate a flame at the discharge end of the burner tube within the combustion zone of a rotary kiln (11), and wherein a flue gas (14) is directed to the burner tube so that the flue gas is used as primary air for combustion of the fuel introduced into the burner tube by the burner lance where it is combusted with the fuel as primary air to generate a flame at the discharge end of the burner tube in the combustion zone of the rotary kiln. And, **JP 07-208705** shows and discloses a burner lance (35) is provided for introducing fuel into the burner tube for combustion with primary air to generate a flame at the discharge end (80, 301) of the burner tube, and wherein a flue gas (120) generated by a gas turbine (10) located outside the kiln wall (90) which in turn is directed

to the burner tube so that the flue gas is used as primary air for combustion of the fuel introduced into the burner tube by the burner lance where it is combusted with the fuel as primary air to generate a flame at the discharge end of the burner tube in the combustion zone of the rotary kiln.” Further, **DE 100 62 066** (of record) shows and discloses a burner lance (15) is provided for introducing fuel into the burner tube (not referenced) for combustion with primary air to generate a flame at the discharge end (not referenced) of the burner tube, and wherein a flue gas (11, 12, 14) generated by a gas turbine (4) located outside the kiln wall (16) which in turn is directed to the burner tube so that the flue gas is used as primary air for combustion of the fuel introduced into the burner tube by the burner lance where it is combusted with the fuel as primary air to generate a flame at the discharge end of the burner tube in the combustion zone of the rotary kiln.”

The indicated allowability of claims 3 and 12 is withdrawn in view of the newly discovered reference(s) to **JP 51- 136716** (newly cited by applicant), **JP 07-208705** (newly cited). Rejections based on the newly cited reference(s) follow.

Accordingly, while applicant’s arguments have been carefully considered, applicant’s claims do not patentably distinguish applicant’s invention over the prior art of record.

See the examiner’s action herein below.

#### **Drawings**

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “feeding the fuel *by the burner lance* into the *front end* of the burner tube” (claims 4 and 15); a cyclone-shaped intermediate burner *in* the burner tube (claim 5); wherein the burner tube, the connecting tube *and the turbine* are constructed as a unit *capable of adjustable position* (claim 11); and a *cooling* air fan (claim

13) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### **Claim Rejections - 35 USC § 112**

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4, 10, 12, 15 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4, 15 and 18 recite the limitation "the front end". There is insufficient antecedent basis for this limitation in the claims.

Claim 10 recites the limitation "the temperature". There is insufficient antecedent basis for this limitation in the claim. Furthermore, it is unclear how merely introducing fuel into the connecting tube necessarily increases the temperature in the burner tube.

In regard to claim 12, it is unclear in what manner the "cooling air fan" is necessarily connected to and/or interacts with the otherwise claimed invention. It is also unclear in what manner the "cooling air fan" is necessarily acts to cool the otherwise claimed invention.

In claim 18, it is unclear what, if any, the "fuel gas primary air" has with the previous recitations thereof. It appears this should be "*the* fuel gas primary air".

**Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

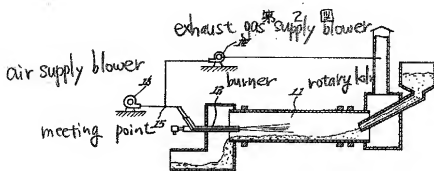
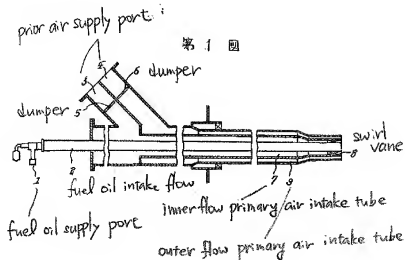
This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims Rejected under 35 U.S.C. 103(a)**

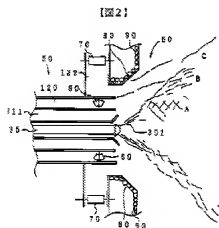
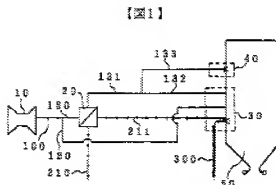
**Claims 1-4, 6-9, 11-14, 16 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over **JP 51- 136716** (newly cited by applicant), **JP 07-208705** (newly cited) or **DE 100 62 066** (of record).

**JP 51- 136716** shows and discloses a burner lance (2) is provided for introducing fuel into the burner tube (9) for combustion with primary air to generate a flame at the discharge end of the burner tube within the combustion zone of a rotary kiln (11), and wherein a flue gas (14) is directed to the burner tube so that the flue gas is used as primary air for combustion of the fuel introduced into the burner tube by the burner lance where it is combusted with the fuel as primary air to generate a flame at the discharge end of the burner tube in the combustion zone of the rotary kiln.

JP 51- 136716 shows:



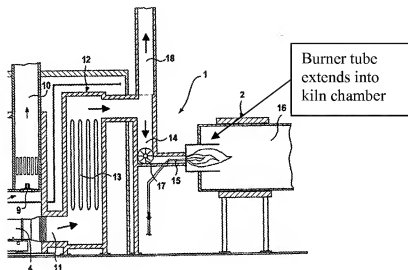
JP 07-208705 teaches, from applicant's same combustion fired furnace field of endeavor, a burner lance (35) is provided for introducing fuel into the burner tube for combustion with primary air to generate a flame at the discharge end (80, 301) of the burner tube, and wherein a flue gas (120) generated by a gas turbine (10) located outside the kiln wall (90) which in turn is directed to the burner tube so that the flue gas is used as primary air for combustion of the fuel introduced into the burner tube by the burner lance where it is combusted with the fuel as primary air to generate a flame at the discharge end of the burner tube in the combustion zone of the rotary kiln."



**DE 100 62 066** teaches, from applicant's same combustion fired furnace field of endeavor, a burner lance (15) is provided for introducing fuel into the burner tube (not referenced) for combustion with primary air to generate a flame at the discharge end (not referenced) of the burner tube, and wherein a flue gas (11, 12, 14) generated by a gas turbine (4) located outside the kiln wall (16) which in turn is directed to the burner tube so that the flue gas is used as primary air for combustion of the fuel introduced into the burner tube by the burner lance where it is combusted with the fuel as primary air to generate a flame at the discharge end of the burner tube in the combustion zone of the rotary kiln. **DE 100 62 066** discloses a cement manufacturing installation comprises a rotating oven (2) having a rotating pipe (16) heated using a burner (15); and a gas turbine arrangement (4) driven by a generator to produce electrical energy. A pipe connection (12) is arranged between an exhaust gas outlet (11) of the gas turbine

arrangement and a combustion air inlet (14) of the burner. The exhaust gas is introduced as combustion air via the pipe connection.

**DE 100 62 066** shows:



**JP 51- 136716** shows and discloses the invention substantially as set forth in the claims with possible exception to:

- an external turbine flue gas source for the flue gas source.

In regard to **claim 1-4, 6-9, 11-14, 16 and 17** for the purpose of providing a suitable alternative flue gas supply for aiding in reducing the formation of NO<sub>x</sub> during combustion, it would have been obvious to a person having ordinary skill in the art to substitute an external turbine flue gas source for the flue gas source (14) of **JP 51- 136716** in view of the teaching of **JP 07-208705**) or **DE 100 62 066**.

In regard to claim 2, since the operating temperature for a given rotary kiln would necessarily depend on numerous interrelated design concerns such as, the overall size and shape of the kiln, the desired operating temperature and/or necessary temperature for treating materials heated therein, to operate a kiln in the claimed temperature range (flue gas of the turbine is 400-

800 °C) can be viewed as nothing more than merely a matter of choice in design absent the showing of any new or unexpected results produced therefrom over the prior art of record. Alternatively, regarding claim 2, Official Notice is taken that turbine exhaust gas temperature are known to fall within the claimed temperature range of 400-800 °C, or 752-1492 °F. (See for example, US 6200128: "A typical turbine exhaust gas will have a temperature of about 1000 to 1100.degree. F ...").

In regard to claim 9, Official Notice is taken that it is well known to tangentially orient burner feed connecting tubes to burner tubes so as to aide in creating a swirling motion and to promote fluid feed mixing (see for example **JP 63-159619** (of record)). Thus, in view of that which is well known and for the known purpose, it would have been obvious to a person having ordinary skill in the art to orient the connecting tube tangential in relation to the burner tube.

In regard to claim 11, the burner tube of **JP 51- 136716** is capable of adjustable positioning, at least during installation thereof.

In regard to claim 12, **JP 51- 136716** includes an air fan (13) which would necessarily and inherently provide a relatively cool flow of air supply to the burner tube.

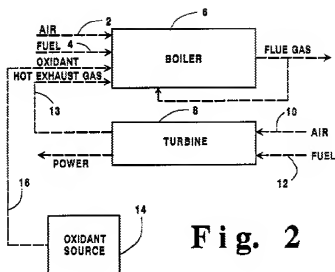
#### **Allowable Subject Matter**

Claims 5, 10, 15 and 18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

#### **Conclusion**

See the attached USPTO for, 892 for prior art made of record and not relied upon which is considered pertinent to applicant's disclosure.

**US 6200128:**



**Fig. 2**

(38) Although described primarily in the context of a boiler or an industrial process furnace, the method of the present invention can be practiced with any air-fuel fired combustion device including, but not limited to steam boilers, petroleum heaters, drying furnaces, high temperature process furnaces, and other ovens and kilns. The combustion device can be one fired with any suitable fuels including natural gas, oil and coal.

(39) Similarly, although the method of the present invention has been described primarily with regard to a gas turbine, the invention can be practiced with any piece of process equipment that generates a hot exhaust gas having an oxygen concentration of less than 21 vol %. Suitable hot exhaust gas generating means include, but are not limited to, gas turbines, incinerators, thermal oxidizers and high temperature air separation units. Preferably, the hot exhaust gas will have a temperature of at least 400.degree. F. and an oxygen concentration of at least 5 vol %. Most preferably, the oxygen concentration of the hot exhaust gas will be at least 10 vol %. A typical turbine exhaust gas will have a temperature of about 1000 to 1100.degree. F., and an oxygen content of about 13 to 14 vol %.

**THIS ACTION IS MADE FINAL**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

#### **USPTO CUSTOMER CONTACT INFORMATION**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carl D. Price whose telephone number is (571) 272-4880. The examiner can normally be reached on Monday through Friday between 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven B. McAllister can be reached on (571) 272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Carl D. Price/

Primary Examiner, Art Unit 3749